Comp. & Maths. with Appls., Vol. 3, pp. 153–154. Pergamon Press 1977. Printed in Great Britain

BRIEF REVIEWS

A Brief Review of a book does not preclude the subsequent publication of a more thorough review.

Computational Methods of Multivariate Analysis in Physical Geography by P. M. MATHER. John Wiley, New York, August 1976. 532 pp. $29.95

This is an advanced textbook and a manual of data analysis for physical geography. The mathematical and computer related material contained in the book is on a fairly elementary level, but the applications to physical geography appear to be nontrivial. The Table of Contents lists four parts: Essentials of Matrix Algebra, Analysis of Dependence, Analysis of Interdependence and Classification. There is an Appendix with a Fortran Subroutine Library.

The book appears to be a well written reference type work for students of physical geography, who need the mathematical approaches utilized here.

Digital System Implementation by GERRIT A. BLAAUW. Prentice-Hall, June 1976. 384 pp. $16.95

As a textbook, this volume aims at seniors or at first year graduate students in computer science. However, it seems to be a useful reference for professionals as well. The contents are arranged as follows: Introduction, Addition, Multiplication, Division, Datapath, Internal Control, System Control, Storage, Communication. There are four appendices: summary of APL, IBM System/360 and INTEL 8080 Instructions, Machine Arithmetic and Switching Algebra.

This is a well designed text, with many useful exercises. One of its most important features is that it includes discussions of many design features of well known computers, which are well illustrated.

An Introduction to the Mathematical Theory of Finite Elements by J. T. ODEN and J. N. REDDY. John Wiley, New York, 1976. 419 pp. $24.95

This is a welcome addition to the Pure and Applied Mathematics series of Wiley Interscience; a thorough and rigorous, yet readable account of some of the most important aspects of finite elements. The book is divided into two principal sections: (1) Mathematical Foundations and (2) The Theory of Finite Elements. Within these, the chapter headings are as follows: (1) Introduction, (2) Distributions, Mollifiers, and Mean Functions, (3) Theory of Sobolev Spaces, (4) Hilbert Space Theory of Traces and Intermediate Spaces, (5) Some Elements of Elliptic Theory, (6) Finite-Element Interpolation, (7) Variational Boundary-Value Problems, (8) Finite-Element Approximations of Elliptic Boundary-Value Problems, (9) Time-Dependent Problems.

Confining itself, as the book does, to essentially only linear partial differential equations, we have here a wealth of material, organized in superb style and in a self contained fashion.

(BRIEF REVIEW SECTION)

Programs and Machines by RICHARD BIRD. John Wiley, New York, August 1976. 214 pp. $16.95

From the author's summary: 'This book is written for programmers and advanced undergraduate or graduate level students of computer science who want a self-contained introduction to the theory of computation.

The subject is developed from programming concepts rather than presented as an abstract mathematical theory. A basic knowledge of computers and programming languages is assumed and the selection and discussion of topics is based upon this knowledge. While some results are mathematical, the proofs are presented as simply as possible, sometimes by example when a rigorous argument would be tedious. Mathematically no formal background is required, apart from some elementary algebra and a familiarity with modern mathematical notation."

Table of Contents: Programs and Machines, The Equivalence of Programs, Algorithms and Universal Machines, Unsolvable Decision Problems, The Correctness of Programs, The Definition of Functions by Recursion, The Fixed Point Theory of Recursion, Applications of the Fixed Point Theory. In addition, the book contains a great selection of well chosen exercises.

Generation, Compilation, Evaluation & Dissemination Of Data For Science & Technology by B. DREYFUS. Pergamon Press, 1975. 171 pp. $25.00

These are the Proceedings of the Fourth International CODATA Conference, which was held at Tsakhcadzor, Armenian SSR, during 24–27 June 1974.

The Proceedings of the first two CODATA (Committee on Data for Science and Technology) conferences were never published, but increased interest made publication of the third one (from 1972) feasible. The present volume should be a source of important reference. The subjects presented at this fourth conference were considerably wider in scope than has been the case previously. Thus, in this volume, there are many presentations on biological sciences, geology, geophysics, geography and astronomy, in addition to physics, chemistry and other 'hard' sciences. Furthermore, there is information of importance here for industrial readers also.